An interoperability service framework for high-resolution image applications.

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ABSTRACT

This poster presents a prototype architecture and potential use-cases for a standards-based service framework to simplify development of high-resolution image viewing clients.

Categories and Subject Descriptors

D.2.12 [**Interoperability**]: Distributed objects; H.3.7 [**Digital Libraries**]: Dissemination

General Terms

Digital libraries, architecture, standards, interoperability, digital imaging, JPEG 2000, JSON, OAI-ORE, OpenURL

Poster content

The JPEG 2000 image format has attracted considerable attention due to its rich feature set defined in a multi-part open ISO standard, and its potential use as a holy-grail preservation format providing both lossless compression and rich service format features. A significant barrier to the adoption of JPEG 2000 has been the lack of an affordable, scalable and open dissemination service solution. Until recently no open source solutions were available and commercial options remain expensive.

Recently we engaged in the development of aDORe djatoka, an open-source JPEG 2000 image server and dissemination framework. The djatoka image server is geared towards Web 2.0 style reuse through URI-addressability of all image disseminations including regions, rotations, and format transformations. Since these URIs serve the purpose of dynamically requesting services pertaining to an identified resource (the entire JPEG 2000 image), the NISO OpenURL Framework Standard was selected as the basis for the definition of an extensible dissemination service framework.

The OpenURL-based image dissemination API simplifies the development of image clients. In the past few months various projects have already developed new Javascript and Flash clients, or have modified existing clients to interact with a djatoka image server (e.g. the Biodiversity Heritage Library[1]).

Currently, the aDORe djatoka project is exploring the use of an additional interoperability layer to 1) make the development of client applications even simpler (e.g. pushing as much common logic to the server as possible) and 2) allow sharing the state of a viewer among compliant viewing applications.

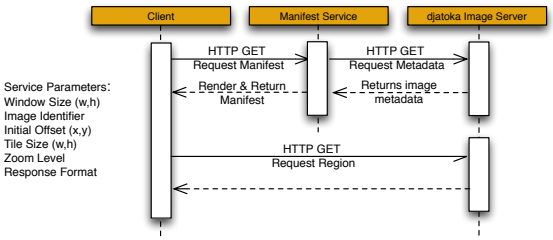

Figure 1: Manifest Service

High-resolution image viewers commonly use a tile-based approach, in which each view in a viewer consists of multiple images. For each such image, the client concurrently computes image coordinates, issues an image dissemination request, and orderly displays the returned image. The proposed interoperability layer reduces the amount of client-side control by pushing the coordinate calculations to the server. In this set up, a client issues an OpenURL-based request for a specific view, and when doing so also provides its environmental variables (e.g. window size, zoom level, tile size, etc). The server responds with a *personalized* manifest containing the URIs of image tiles of which the requested view consists, along with instructions regarding how/where to display those tiles. Using this information, the client requests all constituent tiles, and organizes them properly. Since a manifest describes an aggregation of URI-identified images, it is expressed as an OAI-ORE[2] Resource Map. The URI of the Aggregation described by this Resource Map can be exchanged among compliant yet heterogeneous clients to share the state of a viewing application, for example, in collaborative applications. A JSON serialization of the ORE aggregation is also being explored to further simplify client development.

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[1] http://www.biodiversitylibrary.org/
[2] http://www.openarchives.org/ore/toc